

What Is Claimed Is:

1. An isolated nucleic acid molecule comprising a polynucleotide having a nucleotide sequence at least 95% identical to a sequence selected from the group consisting of:

(a) a nucleotide sequence encoding the Ependymin polypeptide having the complete amino acid sequence in SEQ ID NO:2 (i.e., positions -37 to 187 of SEQ ID NO:2);

(b) a nucleotide sequence encoding the Ependymin polypeptide having the complete amino acid sequence in SEQ ID NO:2 excepting the N-terminal methionine (i.e., positions -36 to 187 of SEQ ID NO:2);

(c) a nucleotide sequence encoding the predicted mature Ependymin polypeptide having the amino acid sequence at positions 1 to 187 in SEQ ID NO:2;

(d) a nucleotide sequence encoding the Ependymin polypeptide having the complete amino acid sequence encoded by the cDNA clone contained in ATCC Deposit No. 209464;

(e) a nucleotide sequence encoding the Ependymin polypeptide having the complete amino acid sequence excepting the N-terminal methionine encoded by the cDNA clone contained in ATCC Deposit No. 209464;

(f) a nucleotide sequence encoding the mature Ependymin polypeptide having the amino acid sequence encoded by the cDNA clone contained in ATCC Deposit No. 209464; and

(g) a nucleotide sequence complementary to any of the nucleotide sequences in (a), (b), (c), (d), (e) or (f), above.

2. The nucleic acid molecule of claim 1 wherein said polynucleotide has the complete nucleotide sequence in Figures 1A, 1B, and 1C (SEQ ID NO:1).

3. The nucleic acid molecule of claim 1 wherein said polynucleotide has the nucleotide sequence in Figures 1A, 1B, and 1C (SEQ ID NO:1) encoding the Ependymin polypeptide having the amino acid sequence in positions -37 to 187 of SEQ ID NO:2.

4. The nucleic acid molecule of claim 1 wherein said polynucleotide has the nucleotide sequence in Figures 1A, 1B, and 1C (SEQ ID NO:1) encoding the mature Ependymin polypeptide having the amino acid sequence from about 1 to about 187 in SEQ ID NO:2.

5. An isolated nucleic acid molecule comprising a polynucleotide having a nucleotide sequence at least 95% identical to a sequence selected from the group consisting of:

(a) a nucleotide sequence encoding a polypeptide comprising the amino acid sequence of residues n-187 of SEQ ID NO:2, where n is an integer in the range of -37 to 5;

(b) a nucleotide sequence encoding a polypeptide comprising the amino acid sequence of residues -37-m of SEQ ID NO:2, where m is an integer in the range of 173 to 187;

(c) a nucleotide sequence encoding a polypeptide having the amino acid sequence consisting of residues n-m of SEQ ID NO:2, where n and m are integers as defined respectively in (a) and (b) above; and

(d) a nucleotide sequence encoding a polypeptide consisting of a portion of the complete Ependymin amino acid sequence encoded by the cDNA clone contained in ATCC Deposit No. 209464 wherein said portion excludes from 1 to about 42 amino acids from the amino terminus of said complete amino acid sequence encoded by the cDNA clone contained in ATCC Deposit No. 209464;

(e) a nucleotide sequence encoding a polypeptide consisting of a portion of the complete Ependymin amino acid sequence encoded by the cDNA clone contained in ATCC Deposit No. 209464 wherein said portion excludes from 1 to about 15 amino acids from the carboxy terminus of said complete amino acid sequence encoded by the cDNA clone contained in ATCC Deposit No. 209464; and

(f) a nucleotide sequence encoding a polypeptide consisting of a portion of the complete Ependymin amino acid sequence encoded by the cDNA clone contained in

ATCC Deposit No. 209464 wherein said portion include a combination of any of the amino terminal and carboxy terminal deletions in (d) and (e), above.

6. The nucleic acid molecule of claim 1 wherein said polynucleotide has the complete nucleotide sequence of the cDNA clone contained in ATCC Deposit No. 209464.

7. The nucleic acid molecule of claim 1 wherein said polynucleotide has the nucleotide sequence encoding the Ependymin polypeptide having the complete amino acid sequence excepting the N-terminal methionine encoded by the cDNA clone contained in ATCC Deposit No. 209464.

8. The nucleic acid molecule of claim 1 wherein said polynucleotide has the nucleotide sequence encoding the mature Ependymin polypeptide having the amino acid sequence encoded by the cDNA clone contained in ATCC Deposit No. 209464.

9. An isolated nucleic acid molecule comprising a polynucleotide which hybridizes under stringent hybridization conditions to a polynucleotide having a nucleotide sequence identical to a nucleotide sequence in (a), (b), (c), (d), (e), (f) or (g) of claim 1 wherein said polynucleotide which hybridizes does not hybridize under stringent hybridization conditions to a polynucleotide having a nucleotide sequence consisting of only A residues or of only T residues.

10. An isolated nucleic acid molecule comprising a polynucleotide which encodes the amino acid sequence of an epitope-bearing portion of a Ependymin polypeptide having an amino acid sequence in (a), (b), (c), (d), (e) or (f) of claim 1.

11. The isolated nucleic acid molecule of claim 10, which encodes an epitope-bearing portion of a Ependymin polypeptide wherein the amino acid sequence of said portion is selected from the group of sequences in SEQ ID NO:2 consisting of: about Ala-1 to about Gln-9; about Pro-8 to about Val-16; about Gln-19 to about Arg-27; about

Ile-69 to about Ser-77; about Asp-86 to about Glu-107; about Glu-113 to about Tyr-123; about Thr-131 to about Gln-139; about Leu-159 to about Phe-167; and about Leu-178 to about Ser-186.

12. A method for making a recombinant vector comprising inserting an isolated nucleic acid molecule of claim 1 into a vector.

13. A recombinant vector produced by the method of claim 12.

14. A method of making a recombinant host cell comprising introducing the recombinant vector of claim 13 into a host cell.

15. A recombinant host cell produced by the method of claim 14.

16. A recombinant method for producing a Ependymin polypeptide, comprising culturing the recombinant host cell of claim 15 under conditions such that said polypeptide is expressed and recovering said polypeptide.

17. An isolated Ependymin polypeptide comprising an amino acid sequence at least 95% identical to a sequence selected from the group consisting of:

(a) the amino acid sequence of the full-length Ependymin polypeptide having the complete amino acid sequence shown in SEQ ID NO:2 (i.e., positions -37 to 187 of SEQ ID NO:2);

(b) the amino acid sequence of the full-length Ependymin polypeptide having the complete amino acid sequence shown in SEQ ID NO:2 excepting the N-terminal methionine (i.e., positions -36 to 187 of SEQ ID NO:2);

(c) the amino acid sequence of the predicted mature Ependymin polypeptide having the amino acid sequence at positions 1 to 187 in SEQ ID NO:2;

(d) the complete amino acid sequence encoded by the cDNA clone contained in the ATCC Deposit No. 209464;

(e) the complete amino acid sequence excepting the N-terminal methionine encoded by the cDNA clone contained in the ATCC Deposit No. 209464; and

(f) the complete amino acid sequence of the predicted mature Ependymin polypeptide encoded by the cDNA clone contained in the ATCC Deposit No. 209464.

18. An isolated polypeptide comprising an epitope-bearing portion of the Ependymin protein, wherein said portion is selected from the group consisting of: a polypeptide comprising amino acid residues from about Ala-1 to about Gln-9 in SEQ ID NO:2; a polypeptide comprising amino acid residues from about Pro-8 to about Val-16 in SEQ ID NO:2; a polypeptide comprising amino acid residues from about Gln-19 to about Arg-27 in SEQ ID NO:2; a polypeptide comprising amino acid residues from about Ile-69 to about Ser-77 in SEQ ID NO:2; a polypeptide comprising amino acid residues from about Asp-86 to about Glu-107 in SEQ ID NO:2; a polypeptide comprising amino acid residues from about Glu-113 to about Tyr-123 in SEQ ID NO:2; a polypeptide comprising amino acid residues from about Thr-131 to about Gln-139 in SEQ ID NO:2; a polypeptide comprising amino acid residues from about Leu-159 to about Phe-167 in SEQ ID NO:2; and a polypeptide comprising amino acid residues from about Leu-178 to about Ser-186 in SEQ ID NO:2.

19. An isolated antibody that binds specifically to a Ependymin polypeptide of claim 17.

~~21-20.~~ An isolated polynucleotide encoding a modified Ependymin protein, wherein, except for at least one conservative amino acid substitution, said modified peptide has an amino acid sequence that is identical to a member selected from the group consisting of:

- (a) amino acids -37 to 187 of SEQ ID NO:2;
- (b) amino acids -36 to 187 of SEQ ID NO:2; and
- (c) amino acids 1 to 187 of SEQ ID NO:2.

22.21. A modified Ependymin, wherein, except for at least one conservative amino acid substitution, said modified peptide has an amino acid sequence that is identical to a member selected from the group consisting of:

- (a) amino acids -37 to 187 of SEQ ID NO:2;
- (b) amino acids -36 to 187 of SEQ ID NO:2; and
- (c) amino acids 1 to 187 of SEQ ID NO:2.

23.22. An isolated nucleic acid molecule comprising a polynucleotide having a sequence at least 95% identical to a sequence selected from the group consisting of:

- (a) the nucleotide sequence of SEQ ID NO:15;
- (b) the nucleotide sequence of SEQ ID NO:16;
- (c) the nucleotide sequence of SEQ ID NO:17;
- (d) the nucleotide sequence of SEQ ID NO:18;
- (e) the nucleotide sequence of SEQ ID NO:19;
- (f) the nucleotide sequence of SEQ ID NO:20;
- (g) the nucleotide sequence of a portion of the sequence shown in Figures 1A, 1B, and 1C (SEQ ID NO:1) wherein said portion comprises at least 50 contiguous nucleotides from nucleotide 1 to nucleotide 2505; and
- (h) a nucleotide sequence complementary to any of the nucleotide sequences in (a), (b), (c), (d), (e), (f) or (g), above.

24.23. A method for the treatment of a patient having need of human ependymin polypeptide comprising:

- (a) isolating the polypeptide of claim 1, and
- (b) administering to the patient a therapeutically effective amount of said polypeptide.

25.24. A method for identifying compounds which bind to and inhibit activation of the polypeptide of claim 1 comprising:

(a) contacting a cell expressing on the surface thereof a receptor for the polypeptide, said receptor being associated with a second component capable of providing a detectable signal in response to the binding of a compound to said receptor, with an analytically detectable human cytokine polypeptide and a compound under conditions to permit binding to the receptor; and

(b) determining whether the compound binds to and inhibits the receptor by detecting the absence of a signal generated from the interaction of the human ependymin polypeptide with the receptor.

27.25. A process for diagnosing a disease or a susceptibility to a disease related to an under-expression of the polypeptide of claim 1 comprising:

(a) isolating a sample of the nucleic acid sequence encoding said polypeptide, and

(b) determining a mutation in a nucleic acid sequence encoding said polypeptide.